REMARKS

This paper is responsive to an Office Action mailed July 11, 2008. Prior to this response, claims 1, 6-15, 20-26, 31-40, and 45-50 were pending. Claims 1, 6-15, 20-26, 31-40, and 45-50 remain pending.

In Section 2 of the Office Action claims 1 and 6-14 have been rejected under 35 U.S.C. 103(a) as unpatentable with respect to Admitted Prior Art (APA) in view of Herpel, "Elementary Stream Management in MPEG-4, IEEE, March 1999 ("Herpel") and Waki et al. ("Waki"; EP 1045564). With respect to claim 1, the Office Action states that the APA discloses using a lid URI to retrieve MPEG-4 resources in an MPEG-2 TS. The Office Action acknowledges that the APA fails to use lid URIs to provide a binding name and access scheme to objects in the OC, but that Herpel and Waki disclose this feature. This rejection is traversed as follows.

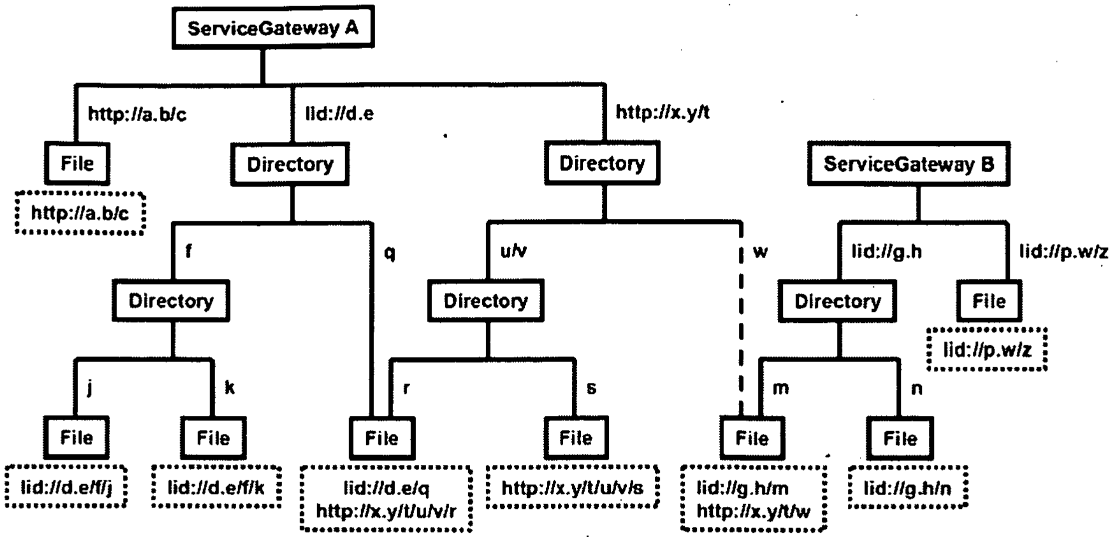
IOR, BIOPProfileBody and NSAP are address schemes specified in the DSM-CC specification to uniquely identify an object in an Object Carousel (OC). DSM-CC is a part of MPEG-2 (Part 6), and a DSM-CC OC and it's defined address structure schemes (such as IOR, NASP, etc.) can be used to carry any kind of data including MPEG-4 files, JPEG files, or Microsoft word documents, to name a few examples. Further, a DSM-CC OC can be used to build a hierarchical directory structure to carry these types of data.

In contrast, a MPEG-4 system is built around an Initial Object Descriptor (IOD), no matter if it is carried over MPEG-4 File

Format, IP, or any kind of transport. IOD is the entry gateway of the MPEG-4 system, from which all other elementary streams (ES) such as scene, video, audio, are linked together. In the MPEG-4 specification, there are only two linkage (reference/address) methods defined, one is called elementary stream identifier (ES-ID), the other is URL. The specification does not permit any other address scheme. An ES-ID is unique to each ES, so a decoder can find the ES in the transport stream by identifying its ES-ID. A URL is also unique. The claimed invention uses a lid type of URL/URI.

Therefore, although a DSM-CC OC can carry MPEG-4 data, the data is not carried in accordance with the MPEG-4 specification. DSM-CC does not provide a way to encode or decode MPEG-4 resources. Alternately stated, MPEG-4 specification does not mention or permit any specific DSM-CC address schemes such as IOR or NSAP addresses. Only ES-ID and URL/URI address schemes are permitted for encoding/decoding.

The claimed invention describes a system that carries data in an MPEG-2 DSM-CC OC. However, the use of a lid URI permits an MPEG-4 to encode or decode MPEG-4 data in the OC. That is, the use of a lid URI decouples the addressing (binding) scheme from the one defined by the DSM-CC, which includes IOR, NSAP, etc. In fact, it doesn't matter what addressing scheme the DSM-CC uses, as long as the lid URI linkages are present. A URI based hierarchical directory structure is as shown below (Fig. 7 of the specification). Each object is referenced by a lid or http URI (some are referenced both by a http and a lid). Each object also has a NSAP address because it is an object in the DSM-CC OC. However, only the base URI need be associated with an NSAP address in



the DSM-CC OC. Once the linkage is created, the rest of the objects can be referenced relatively in the OC. Note however, that a NASP address is not the same as a URI address. Likewise, the address schemes are different. However, an object may have an address in both schemes.

As noted in the Applicant's specification (paragraph [0118]), a lid URI is defined in accordance with SMPTE 343M-2002, as follows:

> A lid: can be bound to a resource entity during authoring and distribution, and may be used to name a device-independent storage location for the entity. The lid: scheme is syntactically similar to the http: scheme, but it is not intended to resolve lid: identifiers to locations outside the broadcast stream or local storage system, as is the case for http: DNS and resource resolution.

A complete copy of SMPTE 343M-2002 is enclosed as Attachment A.

The APA presents details of conventional MPEG-4 and MPEG-2 protocols, citing paragraphs 0006-0015. Paragraphs 0006 lists a number of protocols closely related to MPEG-2, and notes that the

carriage of MPEG-4 data using MPEG-2 transports is a problem yet to be solved.

Paragraph 0007 states that ISO/IEC 13818-1 describes a FlexMux encapsulation scheme (see Herpel, Fig. 8). The MPEG-4 content is referenced using a Program Map Table (Table 1, [0008-0014]). The Program Map Table does not list a lid URI, or the use of a lid URI to access MPEG-4 data in an MPEG-2 TS.

Beginning at [0015], the APA describes the procedure for playing MPEG-4 content. IODs are mentioned, which contain ES_descriptors for BIFS scene and object descriptor streams. Paragraph [0019] states that a URL in a ES-Descriptor can be used to specify a location from which a BIFS stream can be retrieved. The above-cited paragraphs do not disclose an MPEG-2 TS embedded with MPEG-4 organized in an OC or DSM-CC U-U. As noted above, a conventional MPEG-4 system does not encode or decode MPEG-4 resources in a DSM-CC OC. Further, the APA makes no mention is made of a lid, and no mention is made of a lid being used to locate a URI in a MPEG-2 TS.

In Section IV C (page 321) Herpel states that MPEG-2 TSs may be used to encapsulate MPEG-4 streams. Three approaches are presented on page 322 for encapsulating MPEG-4 streams in an MPEG-2 TS, they are: 1) Single Stream Encapsulation; 2) FlexMux Stream Encapsulation; and, 3) Digital Storage Media. Herpel states that Single Stream Encapsulation method is inefficient (pg 322). Herpel states that the FlexMux mapping to a PID can be used to reduce bandwidth. The Applicant notes that neither the Single Stream nor FlexMux method use a URI, and more particularly a lid URI to locate, access, or retrieve MPEG-4

resources from an MPEG-2 TS. Finally, Herpel describes using a DSM-CC carousel for embedding MPEG-4 resources in an MPEG-2 broadcast. The advantage of the approach is that several SL-packetized ESs can be multiplexed into one PID. However, the disadvantage is that the DSM-CC data carousel must be regularly repeated to allow random tune-in. Herpel doubts that "....this enormous waste of bandwidth will be tolerated by service providers." As noted above, there are only 2 MPEG-4 addressing schemes: ES-ID and URL. Herpel does not disclose a method of using lid URIs to provide a binding name and access scheme to objects in the OC. In fact, Herpel appears to be describing an ES-ID system, and Herpel's "regular repeating" method points away from the recited use of lid URIs to locate resources. Alternately stated, although Herpel states that MPEG-4 data can be carried in a DSM-CC OC, he provides no linkage between the IOD needed in an MPEG-4 system for encoding/decoding, and the DSM-CC OC. In the claimed invention, the lid URI provides a linkage between the MPEG-4 and MPEG-2 (DSM-CC) systems.

Waki, in paragraphs [0006-0010] describes a conventional MPEG-2 DSM-CC protocol. No mention is made in the cited paragraphs of using the DSM-CC protocol for the carriage of MPEG-4 data. In paragraphs [0017-0019], Waki presents definitions for IOP::IOR and BIOP. The cited paragraphs do not describe the carriage of MPEG-4 data in an MPEG-2 TS, a URI, a lid URI, or retrieving MPEG-4 resources from an MPEG-2 TS by using a lid URI to provide a binding name and access scheme to objects in an OC. Paragraphs [0132] describes a BIOP::Binding structure. Paragraph [0136] describes Fig. 28, BIOP defining "objectinfo".

Paragraph [0137 describes Fig. 20, definition of BIOP. [0138] describes the direct directory message body in Fig. 20. [0139] describes the insertion of a direct directory message into the "objectinfo" in the BIOP. The direct directory message body is shown in Fig. 6, objects are shown in Figs. 4-5, and directory objects are shown in Figs. 21-22. [0140] describes Fig. 23, a flowchart of the transmitter apparatus 300.

The Applicant notes that the cited sections fail to disclose the exact terms or the general concepts of a URI or lid URI. Thus, the cited section necessarily fails to describe using lid URI to provide a binding name and access scheme to objects in an OC. In fact, the Waki reference fails to even mention to term "MPEG-4", and does not describe a means of carrying MPEG-4 resources in an MPEG-2 TS. The Waki reference appears to have absolutely no relevance to the claimed invention.

The ***Response to Arguments*** Section of the Office Action states that Waki's IOR is the equivalent of a lid URI, as the IOR contains a BIOPProfileBody – all the information pertaining to an object that is needed to uniquely needed to identify the object and locate it within a Service Domain specified by an NSAP address. However, as explained in detail above, while NSAP addresses have relevance in DSM-CC, this type of addressing scheme does not permit encoding or decoding in accordance with the MPEG-4 specification. More important, Waki does not describe a means for an MPEG-4 system to gain access to the NSAP addresses. The claimed invention provides this linkage through the use of a lid URI.

Unlike the more conventional page or http address URI, which is commonly referred to as a URL, the claimed invention recites a narrowly prescribed version of a URI – a local identifier (lid). Unlike a

URI (URL) that points to a web address, or a URI that points to an address in memory, a lid URI permits resources to be referenced in a broadcast message. Alternately stated, a lid URI has the unique ability to label resources that are only available in a broadcast scheme. The use of an MPEG-2 DSM-CC U-U Object Carousel is not new. However, the use of a lid URI to create a linkage between MPEG-4 and DSM-CC systems is novel.

None of the references disclose using a local identifier (lid) to locate a URI in the MPEG-2 TS. In fact, none of the references mention the term "lid", or any functional equivalent. Finally, none of references retrieves MPEG-4 data from an MPEG-2 TS by using lid URIs to provide a binding name and access scheme to objects in the OC. The APA and Herpel describe a FlexMux method of carrying MPEG-4 data in an MPEP-2 TS. Herpel also mentions Single Stream and DSM-CC methods. However, none of the references use a lid to retrieve MPEG-4 resources by providing a name/access scheme to OC objects.

Therefore, even if all three references are combined, the combination does not include every limitation recited in the claimed invention. Neither is there a suggestion to modify references in such a way as the make the claimed invention obvious, since none of the references describe the use of a lid URI, or how a lid URI can be used to access MPEG-4 resources in an MPEG-2 TS. Finally, no evidence has been provided that the use of a lid URI was well known to practitioners in the art, for the carriage of MPEG-4 data in an MPEG-2 TS.

The combination of references neither explicitly discloses all the limitations of claim 1, nor suggests modifications that would make the missing limitations obvious. Claims 6-14, dependent from 1, enjoy the

same distinctions, and the Applicant requests that the rejection be removed.

In Section 3 of the Office Action claims 15 and 20-39 have been rejected under 35 U.S.C. 103(a) as unpatentable with respect to the APA in view of Herpel and Waki, and further in view of Yokomizo (US 2002/0124263. With respect to claims 15 and 26, the Office Action states that the APA/Herpel/Waki fails to disclose embedding a URI in a broadcast MPEG-2 TS, but that Yokomizo discloses this feature. This rejection is traversed as follows.

Yokomizo discloses a system that transmits MPEP-2 data with a BIFS object, which appears as a button on a viewer's screen. The button is linked to a URL. When the viewer "pushes" the button, a connection is made by HTTP protocol to the viewer's set top box, and a synch layer is set for an MPEG-4 stream transmission [0030-0034]. As noted above a URL that accesses a web address can be differentiated from a lid URI that accesses information in a broadcast data stream. Yokomizo does not disclose embedding MPEG-4 resources in an MPEG-2 stream using an OC transport protocol, or using lid URIs to provide a binding name and access scheme to the objects in the OC.

None of the four references disclose using a local identifier (lid) to locate a URI in the MPEG-2 TS. None of the references mention to term "lid", or any functional equivalent. None of references retrieves MPEG-4 data from an MPEG-2 TS by using lid URIs to provide a binding name and access scheme to objects in the OC. Therefore, even if all four of the references are combined, the combination does not include every limitation recited in the claimed invention. Neither is there a suggestion

to modify references in such a way as the make the claimed invention obvious, since none of the references describe the use of a lid URI, or how a lid URI can be used to access MPEG-4 resources in an MPEG-2 TS. Finally, no evidence has been provided that the use of a lid URI was well known to practitioners in the art, for the carriage of MPEG-4 data in an MPEG-2 TS, as recited in claims 15 and 26. Claims 20-25, dependent from 15, and claims 31-39, dependent from claim 26, enjoy the same distinctions, and the Applicant requests that the rejection be removed.

In Section 4 of the Office Action claims 40 and 46-50 have been rejected under 35 U.S.C. 103(a) as unpatentable with respect to the APA in view of Yokomizo, and further in view of Ito et al. ("Ito:, US 6,377,309. With respect to claim 40, the Office Action states that Yokomizo fails to disclose embedding an MPEG-4 encoder, but that Ito discloses this feature. This rejection is traversed as follows.

Ito does not disclose embedding MPEG-4 resources in an MPEG-2 stream using an OC transport protocol, or using lid URIs to provide a binding name and access scheme to the objects in the OC.

Even if Ito's encoder is combined with Yokomizo and the APA, none of the references disclose using a local identifier (lid) to locate a URI in the MPEG-2 TS. None of the references mention to term "lid", or any functional equivalent. None of references retrieves MPEG-4 data from an MPEG-2 TS by using lid URIs to provide a binding name and access scheme to objects in the OC. Therefore, even if all the references are combined, the combination does not include every limitation recited in the claimed invention. Neither is there a suggestion to modify references

in such a way as the make the claimed invention obvious, since none of the references describe the use of a lid URI, or how a lid URI can be used to access MPEG-4 resources in an MPEG-2 TS. Finally, no evidence has been provided that the use of a lid URI was well known to practitioners in the art, for the carriage of MPEG-4 data in an MPEG-2 TS, as recited in claim 40. Claims 46-50, dependent from 40, enjoy the same distinctions, and the Applicant requests that the rejection be removed.

It is believed that the application is in condition for allowance and reconsideration is earnestly solicited.

Respectfully submitted,

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ATTACHMENT A

SMPTE STANDARD

for Television — Declarative Data Essence — Local Identifier (lid:) URI Scheme

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1 Scope

This standard defines the lid: uniform resource identifier (URI), and describes how it is used to identify instances of resources, such as web pages and graphics files, that are transmitted through unidirectional means, such as a television broadcast.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standards indicated below.

IETF RFC 2396, Uniform Resource Identifiers (URI): Generic Syntax

ISO/IEC 11578:1996, Information Technology — Open Systems Interconnection — Remote Procedure Call (RPC), Annex A, Universal Unique Identifier

3 Introduction

Content resources delivered by a one-way broadcast must be identified, stored in a storage system used by the receiver as they are received, and referenced by a uniform scheme for access by applications and systems. Broadcast receivers may use different types of storage devices; therefore, content broadcasters and application developers need a standard syntax for resource storage and reference that does not depend on the specific device or directory syntax, such as the file: URI scheme. A lid: can be bound to a resource entity during authoring and distribution, and may be used to name a device-independent storage location for the entity. The lid: scheme is syntactically similar to the http: scheme, but it is not intended to resolve lid: identifiers to locations outside the broadcast stream or local storage system, as is the case for http: DNS and resource resolution.

The lid: URI scheme enables content creators to assign an authority value that is globally unique. The lid: scheme supports relative paths for resource retrieval, so the authority component can be separately identified in applications to allow relative path references similar to http: and other URI references.

A single lid: can be used to identify different resource instances over time, and will resolve in a receiver to the last instance received with an equivalent lid:. Appropriate lid: identifiers can reduce the storage of redundant instances of resources for better memory efficiency. Storage management for lid: entities is implementation specific and beyond the scope of this specification, but it can be assumed that memory will be finite, and so will the period of persistence of any lid: entity. Applications using lid: should be designed to handle the case where resources have been deleted over time due to storage limitations.

Approved January 3, 2002

4 Definition of local identifier (lid:) URI scheme

The lid: URI scheme describes URI references consisting of a sequence of characters which are independent of their coding in octets in any particular character set. The lid: URI fully complies with IETF RFC 2396 except for the overloading of the authority field in the deprecated form.

The layout of the lid: URI follows the generic URI syntax:

lid://<userinfo>@<host>:<port><path>?<query>#<fragment>

Userinfo is an optional string that enables message ID syntax forms of the authority field and, in combination with the host field, complies with the mid: scheme syntax defined in IETF RFC 2392.

Host is a string whose root is a registered domain name or a uuid (ISO/IEC 11578) in string form. Note that the uuid form is deprecated and is intended to support past common practice.

Port is a string to allow syntactic compatibility with IETF RFC 2616 and has no semantic meaning.

Path is a slash-separated string of components identical to the http: scheme syntax as defined in IETF RFC 2616.

Query and fragment are content-type dependent strings compliant with IETF RFC 2396.

Relative path syntax, as described in section 3 of IETF RFC 2396 is also permitted syntactically, but must only be used in cases where there is a guaranteed mechanism to resolve the absolute path (i.e., the BASE URI is well defined). Practical delivery considerations may require that lid: identified resources be delivered on broadcast channels using absolute paths to enable real-time storage in sequence of resource arrival, but relative path resolution must be supported for lid: resource retrieval, assuming an application specifies the base of the URI by other means.

The following are examples of lid:s:

lid://xbc.com/EveningNews/11-March-01/Pacific/main.html

lid://4F4182C71C1FDD4BA0937A7EB7B8B4C1@mail.xbc.com

A deprecated form of usage is to permit host to be an encoded UUID (ISO/IEC 11578). While technically the UUID name space overlaps the domain name space, in practice a collision is entirely improbable. Examples of this deprecated form using UUID are:

lid://4F4182C71C1FDD4BA0937A7EB7B8B4C1/images/logo.gif

lid://4F4182C7-1C1F-DD4B-A093-7A7EB7B8B4C1/images/logo.gif

The UUID is represented as an ASCII hex coding resulting in 32 characters. Note that two syntaxes are permitted — one with some specifically placed separating hyphens and one without (see the BNF definition below).

When different resources are received with matching lid:s, the most recently received resource should be referenced using that lid:. Thus a lid: may refer to different resources over time. One lid: URI can be assigned for all instances of a resource; or multiple unique URIs can be assigned, one for each instance of the resource.

5 Resolution rules

A lid: URI is used to label a resource. Certain parts of the URI are ignored for the purposes of comparison, when the lid: is used for retrieval, or to replace a previously transmitted resource with an equivalent URI. When testing for equivalence, the query and fragment identifiers (i.e., characters in the lid: including and following the first ? or # character) in a lid: URI are ignored. Notwithstanding, references using fragment and query identifiers may function in ways defined by the content type being referenced.

When comparing two URIs to decide if they match or not, a receiver should use a case-sensitive octet-by-octet comparison of the entire URIs, with these exceptions:

- A port that is empty or not given is equivalent to the default port for http:, which is 80;
- Comparisons of host names shall be case insensitive;
- Comparisons of scheme names shall be case insensitive;
- An empty abs_path is equivalent to an abs_path of /.

Characters other than those in the reserved and unsafe sets (see IETF RFC 2396) are equivalent to their % HEX HEX encoding. For example, the following three URIs are equivalent:

lid://abc.com:80/~smith/home.html

lid://ABC.com/%7Esmith/home.html

lid://ABC.com:/%7esmith/home.html

Unlike http:, a lid: URI is not locatable without more information and is thus URN-like in the generic definition in that a URN is associated to a resource and independent of the resource's location. Therefore, the details of resolution of the location of a lid: is application dependent.

6 Normalization and equivalence

In many cases, different URI strings may actually identify the same resource. For example, the host names used in the URL are case insensitive, so the URL <lid://www.XBC.com> is equivalent to <lid://www.xbc.com>. In general, the rules for equivalence and definition of a normal form, if any, are scheme dependent. When a scheme uses elements of the common syntax, it will also use the common syntax equivalence rules; namely, that the scheme and hostname are case insensitive and a URL with an explicit :port, where the port is the default for the scheme, is equivalent to one where the port is elided.

7 Local identifier syntax BNF

The collected BNF for lid: URIs is as follows:

lid = "lid" ":" "//" authority [abs_path] ["?" query]
["#" fragment]

authority = server | uuid

server = as defined in RFC 2396

abs_path = as defined in RFC 2396

query = as defined in RFC 2396

fragment = as defined in RFC 2396

uuid = uuid_simple | uuid_idl

uuid_simple = 32hex

uuid_idl = 8hex "–" 4hex "–" 4hex "–" 4hex "–" 12hex

hex = as defined in RFC 2396

NOTE – The notation <n> (element) means exactly <n> occurrences of (element); e.g., 32hex means exactly 32 hex digits. Use of the uuid authority element is deprecated.

8 Security considerations

The local identifier URI scheme is subject to the same security implications as in general URI schemes, so the usual precautions apply. This means that some local identifier URIs may refer to resources that are not available (because they have not been received, for example), or to resources that have been received but were intentionally misidentified. The security issues associated with this mislabeling, as well as the security issues associated with the use of HTML content which is broadcast, are the same as those identified in section 11.1 of IETF RFC 2387.

Appropriate security mechanisms should be used in the delivery of content identified by lid: URIs. These include protection of the broadcast signal by data encryption and conditional access methods, and protection of content prior to broadcast so that invalid lid:s are not created, and valid lid:s are not modified.

Annex A (informative)
Converting other URI schemes to lid:

URL references using schemes such as http:, ftp:, and file: can be converted to valid lid:s by changing the scheme component and using the original name, host, path, fragment, and query components. This is useful, for instance, to deliver resources stored on Internet servers over a broadcast channel. Note that the original URL port and password fields have no semantic definition in lid:.

Example:

An Internet resident resource at the location

http://www.xbc.com/tv/text.txt

could be packaged in a broadcast stream with a header containing the resource identifier

lid://www.xbc.com/tv/text.txt

and that resource identifier could be used to store the text.txt entity in memory with a derived directory entry, which would be matched by the following lid: reference in an HTML document

href=lid://www.xbc.com/tv/text.txt?ID=myProgram

Annex B (informative)
Bibliography

IETF RFC 2387, The MIME Multipart/Related Content-Type

IETF RFC 2392, Content-ID and Message-ID Uniform Resource Locators

IETF RFC 2616, Hypertext Transfer Protocol — HTTP/1.1

IETF RFC 2717, Registration Procedures for URL Scheme Names

IETF RFC 2718, Guidelines for New URL Schemes